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January 9, 2017

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Washington D.C. 20554

**Re: Written *Ex Parte* Notice
GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95;
RM-11664 and 11773; and WT Docket No. 10-112**

Dear Ms. Dortch:

On December 1, 2016, the Digital Policy Institute of Ball State University submitted late-filed comments (“*Institute Comments*”) addressing the Petition for Rulemaking of The Boeing Company (“Boeing”) regarding the allocation of additional spectrum for the Fixed-Satellite Service (“FSS”) in the 50.4-52.4 GHz band (“*Boeing Petition*”).¹ Included as an attachment to the Institute Comments was a paper authored by Harold Furchtgott-Roth, entitled Spectrum Allocation at the Federal Communications Commission: Time for a Reset (“*Furchtgott-Roth Paper*”). Boeing is filing its response to the Institute Comments and the Furchtgott-Roth Paper in the dockets for both Boeing’s Petition and for the Commission’s Spectrum Frontiers proceeding because of the importance of these issues to both proceedings.

The Furchtgott-Roth Paper begins with an incorrect premise that Boeing’s proposal for an additional spectrum allocation for FSS in a portion of the V-band² is in conflict with the Spectrum Frontiers proceeding and “impacts the very spectrum allocations the FCC addressed in its decades long proceeding.”³ The Commission’s stated goal for the Spectrum Frontiers proceeding has always been to “adopt a flexible and modern set of rules that can facilitate

¹ See Comments of the Digital Policy Institute and Submission of an Analysis Prepared by Harold Furchtgott-Roth on Behalf of the Center for the Economics of the Internet at the Hudson Institute, RM-11733 (Dec. 1, 2016).

² For purposes of this letter, the V-band includes portions the 37.5-42.5 GHz band and the 47.2-52.4 GHz bands.

³ *Furchtgott-Roth Paper* at 10.

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sharing among a wide variety of users and platforms.”⁴ Such sharing is important because “many of the bands under discussion [in the Spectrum Frontiers proceeding] have shared allocations with satellite.”⁵ The Commission therefore determined in its Spectrum Frontiers proceeding to “examine possible means of allowing enhanced satellite use of shared bands,”⁶ an examination the Commission is continuing in its Further Notice.⁷ Boeing’s petition is fully consistent with this goal by proposing a co-primary allocation for FSS in the 50.4-52.4 GHz band on a shared basis with terrestrial wireless services.⁸

The Furchtgott-Roth Paper also raises questions about whether Boeing could use other spectrum previously allocated to FSS for its proposed satellite system.⁹ Nearly all of the spectrum that Boeing is proposing to use for its satellite system, however, is already allocated on a co-primary basis for FSS. The Boeing Petition seeks only to correct an imbalance that currently exists between FSS uplink and downlink spectrum in the United States by adding an FSS uplink allocation in the 51.4-52.4 GHz band to replace the FSS uplink allocation in the 42.5-43.5 GHz band, the latter of which exists as an FSS allocation in the international table of frequency allocations, but was not adopted by the Commission in the domestic table in order to protect radio astronomy.

The Furchtgott-Roth Paper then advocates for “clearer property rights” in spectrum, asserting that the use of “more market-based spectrum allocations” would have significant economic benefits.¹⁰ In making this argument, the Furchtgott-Roth Paper only briefly acknowledges the Commission’s statutory obligation to establish spectrum allocations in a manner that “would be in the public interest.”¹¹ The paper asserts that spectrum reallocation decisions “if made by an administrative agency considering a wide range of non-economic

⁴ See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, GN Docket No. 14-177, *Notice of Proposed Rulemaking*, FCC 15-138, ¶ 2 (Oct. 23, 2015).

⁵ *Id.*, ¶ 22.

⁶ *Id.*

⁷ For example, the *Further Notice* seeks comment on potentially eliminating the outdated prohibition on satellite earth station receivers operating on an opportunistic basis in the 37/39 GHz band. See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al., GN Docket No. 14-177, et al., *Report and Order and Further Notice of Proposed Rulemaking*, FCC 16-89, ¶¶ 500-502 (July 14, 2016).

⁸ *Contra Furchtgott-Roth Paper* (incorrectly claiming that “Boeing asserts that the satellite and terrestrial services are incompatible”).

⁹ See *id.* at 14.

¹⁰ See *id.* at 6-9.

¹¹ 47 U.S.C. 303(y)(2)(a).

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factors, may not make economic sense, either at the time of the reallocation, or years in the future.”¹²

Of course, the careful consideration of important non-economic factors is a fundamental obligation for the Commission. The Communications Act highlights some of these factors, such as the need “to make available, so far as possible, to all the people of the United States . . . rapid, efficient, Nation-wide, and world-wide” communications services,¹³ and “the equitable distribution of radio service throughout the nation.”¹⁴

In apparent recognition of the importance of non-economic considerations, the Furchtgott-Roth Paper constructs an argument that a purely market-based system may be able to achieve public interest objectives. Referencing the writings of economist Ronald Coase, the paper explains that “in the absence of transactions costs, assets will gravitate towards their highest-valued use.”¹⁵ Leaving aside the question of whether the “highest-valued use” is synonymous with the public interest, the paper’s thesis, as noted above, is expressly conditioned on “the absence of transaction costs,” a situation that rarely exists in real life.

The Furchtgott-Roth Paper makes no further reference to the essential role of transaction costs in allocating scarce resources such as spectrum. Coase, however, wrote extensively about this issue, acknowledging that transaction costs “are often extremely costly, sufficiently costly at any rate to prevent many transactions that would be carried out in a world in which the pricing system worked without cost.”¹⁶ For example, Coase observed that “[w]hen large numbers of people are involved, the argument for the institution of property rights is weakened and that for general regulations becomes stronger.”¹⁷

The allocation of scarce spectrum resources provides a clear example of a situation that is burdened with exceedingly high transaction costs. Most spectrum uses are best allocated

¹² *Furchtgott-Roth Paper* at 8.

¹³ 47 U.S.C. § 151.

¹⁴ 47 U.S.C. § 307(b).

¹⁵ *Furchtgott-Roth Paper* at 12.

¹⁶ Coase, Ronald H., “The Problem of Social Cost,” *The Journal of Law & Economics*, 15 (1960) (*available at* <http://www.jstor.org/stable/724810>) (“*Coase, The Problem of Social Cost*”). Coase provides as examples of transaction costs the need “to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.” *Id.*

¹⁷ Coase, Ronald H., “The Federal Communications Commission,” *The Journal of Law & Economics*, 29 (1959) (*available at* <http://www.jstor.org/stable/724927>) (“*Coase, The Federal Communications Commission*”).

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consistently nationwide so that the same consumer devices (such as televisions) can work in every city, and aircraft communications systems work reliably in both the originating and destination airports. Likewise, most satellite systems cover entire regions, countries, or continents, necessitating access to the same spectrum in every location. The transaction costs of privately securing consistent access for such spectrum nationwide or worldwide would arguably be insurmountable.

The construction of a major highway provides a clear example. Although a growing number of highways are privately owned, their construction necessitates aggressive intervention by the government to identify and secure the land for construction. Highways cut narrow paths across long distances. In contrast, radio communications services (particularly satellite services) can cover all areas, making the negotiation and acquisition process exponentially more challenging. As Coase explained, in such cases “[w]hen the transfer of rights has to come about as a result of market transactions carried out between large numbers of people or organizations acting jointly, the process of negotiation may be so difficult and time-consuming as to make such transfers a practical impossibility.”¹⁸ Coase thus acknowledged the importance of “direct Government regulation” to achieve the most efficient and beneficial results in these complex situations.¹⁹

The Commission’s existing approach of considering spectrum allocation decisions based on a variety of public interest factors, both economic and non-economic, is therefore consistent with Coase’s writings and, far more important, the statutory mandates of the Communications Act. The Furchtgott-Roth Paper, however, criticizes the Commission’s public interest ascertainment process, observing that:

The challenge for the FCC is not to be omniscient of future technologies. That is impossible. Nor is the challenge for the FCC to discern which among competing interested parties has a better and more accurate story to tell about the future. That too is impossible.

On this point, Boeing agrees. It is exceedingly difficult for the Commission to discern today the future needs of consumers and communications industries. The answer, however, is not to abandon the Commission’s public interest obligations in favor of market-based mechanisms, particularly since such mechanisms are unlikely to succeed in efficiently managing the allocation of scarce spectrum resources. Instead, the correct answer is for the Commission to

¹⁸ *Id.*

¹⁹ Coase, *The Problem of Social Cost* at 17.

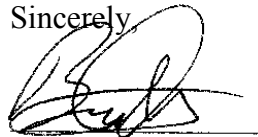
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make spectrum allocation decisions that diversify spectrum use. Rather than allocate all or most of entire spectrum bands to one type of communications service, the Commission should diversify its spectrum allocation decisions by making significant spectrum resources available for different types of services, as much of it as possible on a co-primary shared basis.

The use of a diversified approach is particularly important in millimeter wave (“mmW”) spectrum given the repeated acknowledgement of the terrestrial wireless industry that its use of mmW spectrum may be limited primarily to urban areas.²⁰ In contrast, satellite systems, by their nature, provide broadband communications services on a consistent basis to all communities and locations. The use of a diversified allocation approach would therefore maximize the likelihood that the Commission’s spectrum allocation decisions serve the public interest and provide the greatest public benefit, both for the current generation and those of the future.

Thank you for your attention to this matter. Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Bruce A. Olcott", written over a horizontal line.

Bruce A. Olcott
Counsel to The Boeing Company

²⁰ See, e.g., Comments of CTIA, GN Docket No. 14-177, at 3 (Sept. 30, 2016) (explaining that “[w]hile the millimeter wave bands will help strengthen 5G network capacity, mid- and low-band spectrum will continue to drive network coverage”); Comments of Qualcomm Incorporated, GN Docket No. 14-177, at 4 (Sept. 30, 2016) (explaining that “5G operations in spectrum bands above 24 GHz will provide ultra-high-speed service in high-traffic areas, supplementing 5G and 4G services that use sub-6 GHz spectrum to provide coast-to-coast connectivity”); Comments of Huawei Technologies, Inc. (USA) and Huawei Technologies Co., Ltd., GN Docket No. 14-177, at 13 (Sept. 30, 2016) (explaining that “the high density traffic levels for which the mmW channels are planned are not well-suited for general wide area mobile coverage (such as that provided by current low frequency, *i.e.*, < 3.6 GHz cellular systems”).